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GPS Vehicle Tracker

User Manual **version 1.6**

Document Review

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1. Product Overview

AVL-100 is a GPS/GPRS based tracking device specially developed and designed for vehicle real-time tracking and fleet management.

AVL-100 has inbuilt GPS module to obtain accurate position data and utilizes its GSM capability to send the position data to a specified mobile phone or server base for tracking and fleet management.

With internal memory, AVL-100 can store GPS coordinates when there is no GPRS connection or at a specified interval requested by the user.

One optional feature of AVL-100 is that a microphone can be linked out to be hidden somewhere inside the vehicle for listening to the cabin.

AVL-100 has the following functions and features:

- SMS and GPRS TCP/UDP Communication
- Track on Demand
- Show Location Directly on Mobile Phone
- Track by Time Interval
- Listen (Voice Wiretapping) (Optional)
- GSM Blind Area Memory
- Logging Capacity up to 180,000 Waypoints
- Inbuilt Motion Sensor for Power Saving
- SOS Panic Button
- Geo-fencing Control
- Low Battery Alarm
- Speeding Alarm
- Power-cut Alarm
- Engine Cut (Stop Engine)
- I/O: 1 switch inputs, 2 digital inputs, 1 digital output, 1 analog input.

2. For Your Safety

Read these simple guidelines. Not following them may be dangerous or illegal.

Proper Connection	When connecting with other device, read carefully its manual so as to carry out correct installation. Do not connect it to other incompatible devices.
Qualified Accessories	Use original parts, qualified batteries and peripheral equipments to avoid damage to AVL-100.
Safe Driving	Drivers should not operate this product while driving.

Qualified Service	Only qualified personnel can install or repair AVL-100.
Water Resistance	AVL-100 is not water resistant. Keep it dry. Install it inside the vehicle or use waterproof bag if necessary.
Confidential Phone Number	For safety reason, do not tell other people the mobile phone number of your AVL-100 without taking precautions of security settings.

3. AVL-100 Characteristics

Items	Specification
Power Supply	+12V - +24V / 1.5A
Backup Battery	850mAh
Normal power consumption	85mA/h
Dimension	70*76*28mm
Weight	140g
Operating temperature	-20° to 80° C
Humidity	5% to 95% Non-condensing
Frequency	Quad Band GSM 850/900/1800/1900Mhz
GPS Module	latest GPS SIRF-Star III chipset
GPS Sensitivity	-158Db
GPS Frequency	L1, 1575.42 MHz
C/A Code	1.023 MHz chip rate
Channels	20 channel all-in-view tracking
Position Accuracy	10 meters, 2D RMS
Velocity Accuracy	0.1 m/s
Time Accuracy	1 us synchronized to GPS time
Default datum	WGS-84
Reacquisition	0.1 sec., average
Hot start	1 sec., average
Warm start	38 sec., average
Cold start	42 sec., average
Altitude Limit	18,000 meters (60,000 feet) max.
Velocity Limit	515 meters/second (1000 knots) max.
LED	3 LED lights to show GPS/GSM/Power status.
Flash Memory	32MB
Button	One SOS Button
Interface	1 switch inputs, 2 digital inputs , 1 digital output,1 analog input

4. Getting Started

This section will describe how to set up your AVL-100.

4.1 Hardware and Accessories

AVL-100 is supplied in a box which includes:

AVL-100 with Battery

GPS Antenna

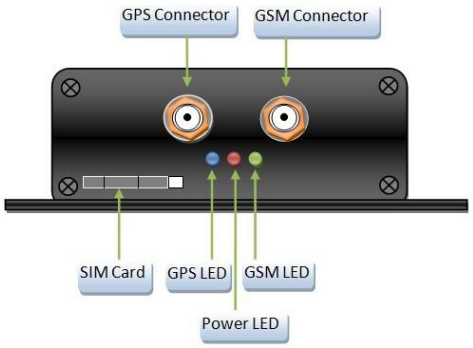
GSM Antenna

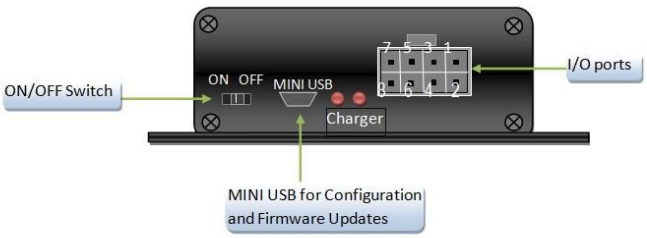
Wires with SOS Button

Configuration Cable

CD-Rom

4.2 Outside feature

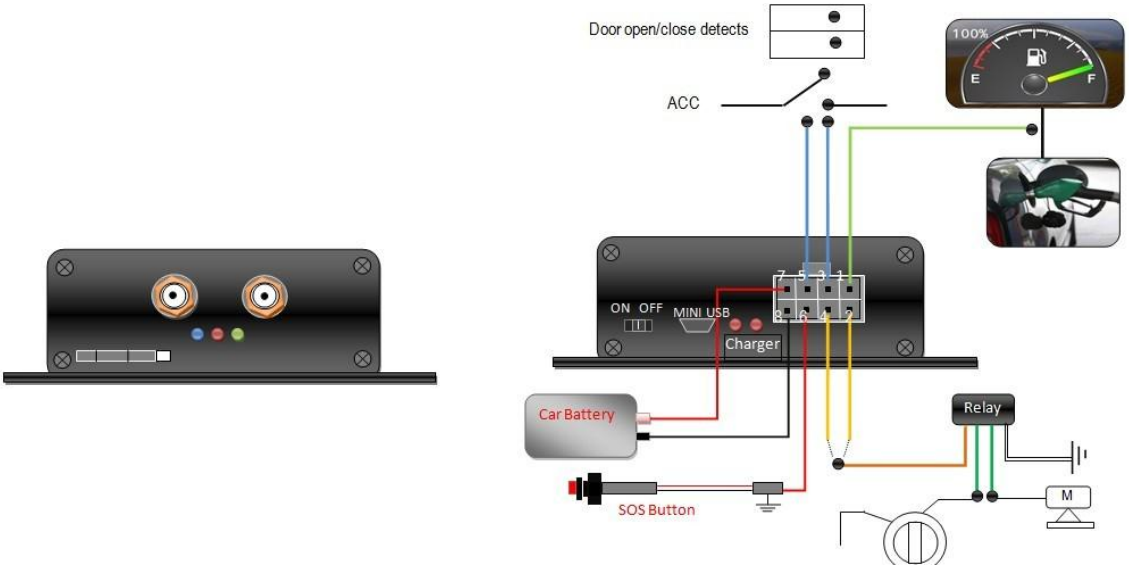




GPS LED (Blue LED)	
light 0.1s dark 2.9s	GPS Signal Well
light 1s dark 2s	No GPS signal
light 0.5s dark 0.5s	GPS Fault
Tremble/Power LED (Red LED)	
light 0.1s dark 0.1s	System Initial
light 1s dark 2s	Low Power
light 0.1s dark 2.9s	Power Good
always light	On Tremble
GSM LED (Green LED)	
light 0.1s dark 0.1s	System Initial
light 0.1s dark 2.9s	GSM Signal Well
light 1s dark 2s	No GSM Signal
always dark	No SIM Card Or Bad SIM Card
light 0.1s dark 0.1s (flash three times)	Call Ring
always light	In A Call
light 0.1s dark 0.3s (flash five times)	Send A SMS

SOS Button	SOS button is connected with the wires. Press it to send SOS alarm to preauthorized phone number.
Configuration cable	Used for firmware update, configuration TT500 on PC (configuration which in the CD is required.)
SIM Card Holder	To insert SIM card here
GSM Antenna	Connector for GSM antenna
GPS Antenna	Connector for GPS antenna
Microphone	A microphone to be linked out for listening to the cabin (wiretapping)
Power On/Off Button	Press and hold for 3~5 seconds to turn on/off TT500.

4.3 IO socket feature



DC Characteristics of PINs

PIN	Inactive	Active	Maximum
Digital input 1 (PIN5)	Open drain or >1V	0V(GND)	45V
Digital input 2 (PIN3)	Open drain or 0V(GND)	>3V	45V
Digital output A/B (PIN4/2)	Open drain	0V (GND)	45V/500mA
Analog input (PIN1)	/	0~6V	30V
DC IN (PIN7+PIN8)	/	12-24V	45V

Application of PINs

PIN	Alarm	Application	Description
Pin 1	/	Fuel sensor	Analog Input to detect the voltage; always use to detect the fuel in the tank. Instruction Reference: *$$$$$$,008,ABCDEFG#, *$$$$$$,113,A,B#
Pin 2	/	Cut circuit	Connect with a relay to cut current circuit; Instruction Reference: *$$$$$$,025,B,Y#
Pin 3	0x52 0x53	Door status	Once this Pin3 was triggered by high voltage or it drops to low level, tracker will send a GPRS alarm to your preset server. Alarm type for it is: 52/53; Always used to detect door status.
Pin 4	/	Cut engine	Connect with a relay to cut current circuit; Instruction Reference: *$$$$$$,025,A,Y#
Pin 5	0x50 0x51	Engine status	The function is the same as I/O 3, but the alarm type is “50”, “51”. Use to Detect status of the engine;
Pin 6	0x01	SOS	When SOS Button cable is connected to GND(port 08), namely trigger, the unit will send out a data via SMS or GPRS, alarm type is “01”
Pin 7	/	Positive (+12v)	The anode of power input socket (12V~24v);
Pin 8	/	GND	GND, the cathode of power input socket;

4.4 Connecting and Installation

Read this manual before using your AVL-100 and check if all parts are included in the packaging box.

4.4.1 Ensure that your AVL-100 has a working SIM installed.

- Check that the SIM hasn't run out of credit (test the SIM in a phone to make sure it can send and receive SMS)
- Check that the SIM Lock code is turned off
- If you require the function of sending an SMS location report to the authorized phone number when it makes a call to the AVL-100, please make sure the SIM installed supports displaying caller ID.

4.4.2 Antenna Connection

Connect the GSM Antenna to AVL-100.

Connect the GPS Antenna to AVL-100.

- GPS antenna is used to receive satellite signals in the sky. It should be fixed to face the sky (to be placed under the windscreen is recommended) and should not be covered or shielded by any objects containing metal.

4.4.3 Find a suitable place inside the car for installing AVL-100. Wiring connections must be firm and reliable and the joints should be wrapped with insulating tape tightly. The unused electrical wire should be properly insulated. Check if all wirings have been connected correctly and then connect the AVL unit to the motor power.

Check that the Red LED (Battery) is flashing light 0.1s and dark 2.9s.

Make a missed phone call the AVL-100 using a mobile phone to check if the calling can go through and the AVL-100 replies with an SMS indicating longitude, latitude, speed and date.

5. Change Password

Command: *$$$$$$,001,@@@@@@#

Description: Change user's password.

Note:

1. $$$$$$ is user's password and the default password is 000000. The tracker will only accept commands from a user with the correct password. Commands with wrong password will be ignored.
2. @@@@@@is the new password. Password should be 6 digits.

Example:

*$$$$$$,001,@@@@@@#

*000000,001,123456#

The password will change to 123456.

6. Track

6.1 Track by SMS

- Track on Demand - Reply with longitude, latitude, speed and date

Command: *$$$$$$,000#

Description: Get the current location of the tracker, send this SMS or make a telephone call directly to the tracker and it will report its longitude and latitude by SMS with format as follows:-

Lat:+2232.5742N Long:+11403.3990E Spd:000km/h Fix:A Sat:04 HDOP:02.6 GSM:12 Batt:04.18V

Mile:0.0564 Time:11/07/11 09:59:29

Example:

*$$$$$$,000#

*000000,000#

Tracker will send the current position to your mobile by SMS.

- Track on Demand - Reply with a Google link

Command: *$$$$$$,100#

Description: Send this command to the tracker and then you receive an SMS with an http link. Click on the link then the location can be shown directly on Google Map on your mobile phone. For example:

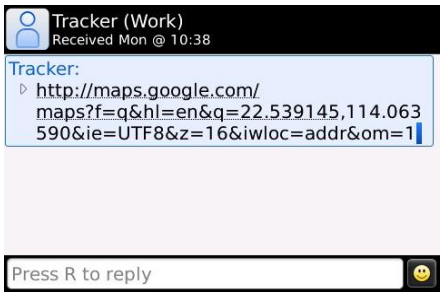
http://maps.google.com/maps?f=q&hl=en&q=22.539145,114.063590&ie=UTF8&z=16&iwloc=addr&om=1

Note: Only smart phones and PDA support this function.

Example:

*$$$$$$,100#

*000000,100#



6.2 Track by Calling

Make a missed call to the tracker and it will report its longitude and latitude by SMS with format as follows:-
Lat:+2232.5742N Long:+11403.3990E Spd:000km/h Fix:A Sat:04 HDOP:02.6 GSM:12 Batt:04.18V
Mile:0.0564 Time:11/07/11 09:59:29

6.3 Track by Preset Interval

Command: *$$$$$$,002,X,Y#

Description: Set an interval for the tracker to continuously return its location by SMS

Note:

1. X is the interval in minute. If XXX=000 to turn off tracking by time
2. Y is the amount of SMS which are going to send to your mobile. If Y=999, tracker will send SMS continuously.

Example:

*$$$$$$,002,X,Y#

*000000,002,5,999#

The tracker will send location data back to your mobile phone every 30 minutes;

6.4 Track by fixed miles Interval

Command: *$$$$$$,121,X,Y#

Description: send the GPRS by fixed time interval;

X=0 disable this function, X=1 enable this function;

Y= [0, 60000]/meter The value of the distance can be set.

Example:

*$$$$$$,121,X,Y#

#000000,121,1,50#

The tracker will send location data back to your mobile phone every 50 meters;

6.5 Google Earth and Google Map

Download Google Earth from http://earth.google.com/ .

Start Google Earth (For more information about Google Earth please refer to http://earth.google.com/) or go to http://maps.google.com in your Internet Explorer.

Input the latitude and longitude that you receive from the tracker by SMS and click the search button.

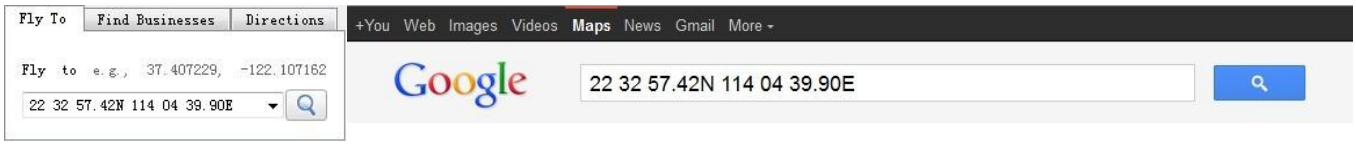
Google Earth or Google Maps will display the location for you.

Example:

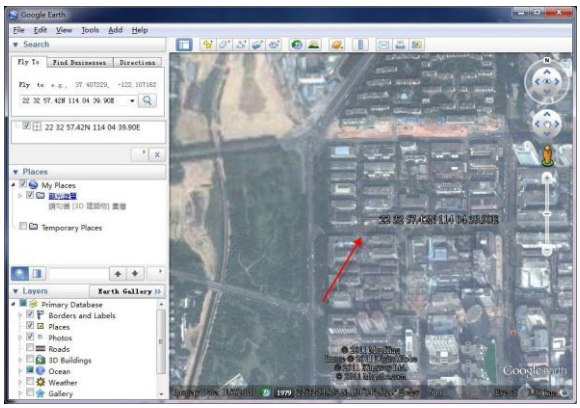
When you receive: Lat:+2232.5742N Long:+11403.3990E

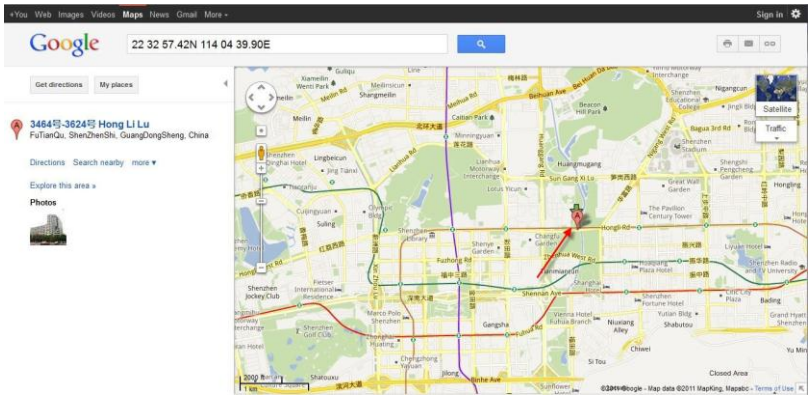
Type as the following picture shows:

(Note: you should input the latitude and longitude as: 22 32 57.42N 114 04 39.90E



And then you can find the location of your tracker:





7. Authorization

Command: *$$$$$$,003,0,F,CallNumber, SMS Number#

Description: Authorize phone numbers for the SOS button (or inputs) for receiving location reports and SMS alarms.

Note: To authorize phone numbers for the buttons/inputs for receiving location reports and SMS alarms.

F=0, to turn off this function; (default) F=1, sends SMS to the authorized phone number;

Call Number: reserved function. Should be the same as SMS number

SMS Number: Emergency message (SOS button message) and timed report will send to this mobile number.

Note: Preset phone number. Maximum length is 25 digits. And don't put area code or country code before your mobile number.

Example:

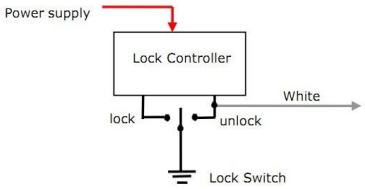
*$$$$$$,003,0,1, CallNumber, SMS Number #

*000000,003,0,1,13800000000, 13800000000#

Tracker will send the time interval SMS message and SOS alarm to this number: 13800000000

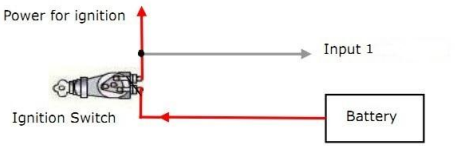
8. Application Examples for Inputs.

8.1 Detecting Lock Status of Car's Door or Trunk (Car Boot).



When the lock is opened, there will be negative triggering to digital input 2 (Pin 2), then a GPRS alarm will be sent to the server (please refer to the GPRS Command 0x52 or 0x53 in protocol).

8.2 Ignition Detection



Digital input 1 (PIN5) (positive triggering) can be used for ignition detection. The detection alarm will be sent to the server via GPRS. Please refer to <GPRS Communication Protocol> Alarm Command 0x50 or 0x51 for more information.

8.3 Analog Input

Please refer to <GPRS Communication Protocol >for more information for AD data.

For example: $$B8359772032646201|AA$GPRMC,011145.000,A,1338.9360,N,10033.6802,E,0.18,209.72,190911,,,A*60|01.6|00.9|01.3|000010000000|20110919011144|14122618|**0000**0100|32D2034F|0000|0.0000|2552|1943

Command: *$$$$$$,113,A,B#

Description: Used to detect the fuel in the tank. Tracker gathers the voltage from fuel tank and then calculates the balance of the fuel. The voltage when the fuel tank is empty or full should be known first.

Note:

AD is 0000 in blue.

A, B= [0, 2000] (unit: 0.01V)

A: voltage when no fuel in tank

B: voltage when with full fuel in tank

If C is current voltage, output percent P=(B-A)/(C-A)×100%

Example: *000000,113,100,500#

Voltage is 1V when no fuel in tank, voltage is 5V when with full fuel in tank. If current voltage is 4V, the output percent of fuel is as below: (4-1)/(5-1)×100%=75%

In this example, tracker detect there is still 75% fuel in the tank.

Command: *$$$$$$,008,ABCDEFG#

Description: balance of fuel can be showed in two way in GPRS message: percentage or the really voltage of the tank. In this instruction, this parameter "F" is used to switch this two status.

Note:

if F=1, show as percentage. Otherwise, it will show as really voltage of the tank.

Example:

*$$$$$$,008,ABCDEFG#

*000000,008,00000010#

In this example, balance in the tank will show as percentage in *<GPRS Protocol>*

9. Low Battery Alarm

Command: *$$$$$$,004,XXX,YYY#

Description: When the tracker's voltage is lower than the preset value, it will send a GPRS alarm to preset server.

The alarm type of this GPRS message is 0x10. Please refer to *<GPRS message>* for more detailed information.

Note: XXX is the preset value of voltage. YYY is auto shut down voltage. Unit of this X and Y is 0.01V

Example:

*$$$$$$,004,XXX,YYY#

*000000,004,380,350#

In this example, tracker will send a GPRS message to server when its battery voltage at 3.8V and auto shutdown at 3.5V.

10. Over speed

Command: *$$$$$$,005,S,X,Y,Z#

Description: Turn on speeding alarm. When the tracker speeds higher than the preset value, it will send an SMS to the phone number for SOS.

Note: S=1 Enable speed alarm, S=0 Disable speed alarm.

X= [10<XXX<250] (The speed preset value); unit is km/h

Y = [1,999] (The times over speed), unit is second

Z= [10,360] (The time interval to send speed alarm) unit is second.

Example:

*$$$$$$,005,S,X,Y,Z#

*$$$$$$,005,1,80,60,120#

When the tracker's speed is over 80km/h, an SMS alarm will be sent out.

11. Geo-fence

11.1 Geo-fence Alarm

Command: *$$$$$$,006,+lat1,+long1,+lat2,+long2,X,Y#

Description: Turns on Geo-fencing alarm. When the tracker moves in/out the preset scope, it will send an SMS alarm to the authorized phone number for SOS.

Note:

1. Lat= [-9000.0000, +9000.0000], Long = [-18000.0000, +18000.0000].
2. X= [10,360] is time interval to send Geo-fence alarm message.
3. Y=0, Disable GEO-fence alarm, Y=1, Into GEO-fence alarm; Y=2, Out of GEO-fence alarm;
4. Long1>long2&lat1>lat2

Example:

*$$$$$$,006,+lat1,+long1,+lat2,+long2,X,Y#

*000000,006,+1030.5400,-06647.3910,+1025.2522,-06659.2650,10,2#

Remarks:

1. **Only one alarm can be set in either in or out;**

12. Output Control

12.1 Output Control (Unlimited)

Command: *$$$$$$,025,X,Y#

Description: Send this command to control the Output of AVL-100

Note:

X=A means the output1(port 4)

Y=0, to close the output (open drain);

Y=1, to open the output (low voltage);

Example:

*$$$$$$,025,X,Y#

*000000,025,A,1#

Tracker will cut the engine of the vehicle.

12.2 Output Control (Limited)

Command: *$$$$$$,117,A,B,C,D# and *$$$$$$,116,A#

Description:

A is the value of speed which trigger this command. If speed is lower than A km/h, output will be open drain for B seconds and then restore for C seconds, and it will repeat D times.

Note:

A=[0,999]km/h, the threshold of speed. B=[0,60000]/ms, open drain output for B seconds.

C=[0,60000]/ms, restore output for C second D=[0,99],times to repeat the process between B and C.

116 instruction use to enable/disable 117 instruction. If A=0, it means turn 117 instruction off.

Example:

*$$$$$$,117,A,B,C,D#

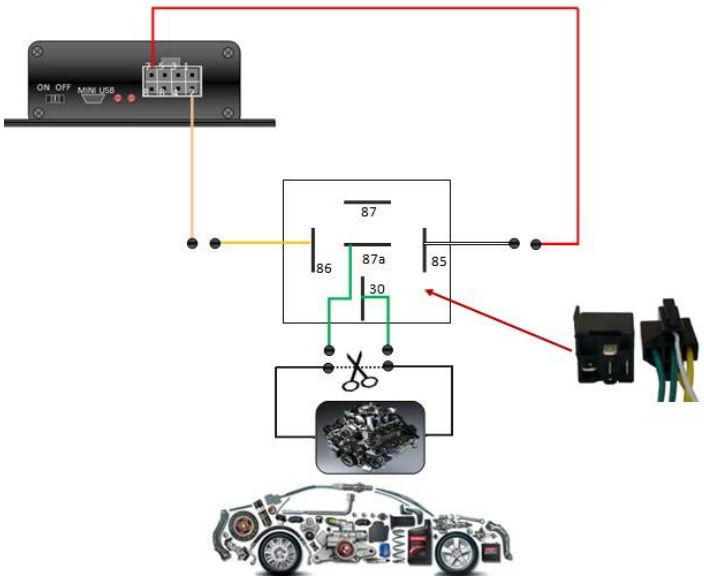
*000000,117,60,500,3000,5# *000000,116,1#

In this example, once the tracker's speed is lower than 60km/h, tracker/vehicle will stop for 0.5s and restore for 3s. and repeat this process 5 times.

12.3 Application Examples for Outputs

12.3.1 Engine Cut

Relay Connection: Connect a replay as below picture shows:



Calculate the correct VCC value according to relay's parameter to comply with the following requirements:

Output open drain sink voltage (ineffective)	45V max
Output Low voltage sink current (effective)	500mA max

Normally two green wires are connected solidly (P1 and P2 are Normal Close[NC] in the relay), when output is open (Output be low voltage), two green wires will disconnect, the engine is then cut.

Take digital Output1 (PIN5) as an example:

*$$$$$$,025,A,1# (cut engine)

*000000,025,A,0# (cancel engine-cut)

13. SMS/GPRS instruction

Annex 1. SMS Command List

<Note: these commands can be also sent by GPRS>

Note: ****** is user's password and the default password is **000000**. The tracker will only accept commands from a user with the correct password. Commands with wrong password will be ignored.

Description	SMS Command	Example
Track on Demand	*$$$$$$,000#	*000000,000#
Remarks: To get the current location of the tracker, send this SMS or make a telephone call directly to the tracker and it will report its longitude and latitude by SMS with format as follows: Lat:+2232.5742N Long:+11403.3990E Spd:000km/h Fix: A Sat:04 HDOP:02.6 GSM:12 Batt:04.18V Mile:0.0564 Time:11/07/11 09:59:29		
Track on Demand -Google Link	*$$$$$$,100#	*000000,100#
Remarks: Send this command to the tracker and then you receive an SMS with an http link. Click on the link then the location can be shown directly on Google Map on your mobile phone. For example: *http://maps.google.com/maps?f=q&hl=en&q=22.539145,114.063590&ie=UTF8&z=16&iwloc=addr&om=1* Note: Only smart phones and PDA support this function.		
Change Password	*$$$$$$,001,@@@@@@#	*000000,001,123456#
Remarks: $$$$$$ is old password @@@@@@ is new Password **e.g. *000000,001,123456#** The password number will be 123456 after you set successfully. Note: if you forget the password, you should initialize the device or reload the firmware to get the default password: 00000		
Track by Interval	*$$$$$$,002,X,Y#	*$$$$$$,002,3,999#
Remarks: X =0, Stop send position SMS = [1,60000] Time interval (Unit: minute) (Note: Max:3 digits) Y =0 Disable this function; =(1,999) times of sending data via SMS =999 send data via SMS continuously **e.g. *000000,002,3,999#** Tracker will send SMS to one cell phone continuously in 3 minutes interval Note: The SMS will be sent to the SOS number. So you should set the SMS command 003 also. To set interval for automatic timed report by SMS. X (maximum is 3 digital) is the interval in minute. If X=0, tracker will stop sending timed report to your mobile.		

Set a preset phone & SMS number for SOS button	*$$$$$$,003,0,F,CallNumber, SMS Number#	*$$$$$$,003,0,F,13800000000, 13800000000#

Remarks: F =0, Disable this function

=1, Tracker sends an alarm SMS to the preset SMS Number

e.g. *000000,003,0,1,12345,12345#

The SOS alert data will be sent to cell number: 13800000000.

Note: 1. Tel Number and SMS Number (must <25 digits).

2. The call number and SMS number should be same.

3. If the SOS button is pressed, the SOS alert data will be sent to this number.

4. The interval SMS will be sent to this number.

Low Battery Alarm	*$$$$$$,004,XXX,YYY#	*$$$$$$,004,380,350#

Remarks: XXX: voltage for lower power alarm

YYY: voltage for auto shut down alarm

e.g. *000000,004,380,350#

380 indicate 3.8V for the internal battery. 350 indicate 3.5V for the internal battery.

When the device battery drops to 3.8V, the device will send Low battery Alarm (alarm type: Ox10) via GPRS every 10 minutes.

When the device battery drops to 3.5V, the device will send auto shutdown alarm (alarm type: Ox09) via GPRS, and auto shuts down.

Note: 1. XXX and YYY are voltage

2. The default voltage for lower power alarm is 3.6V.
   The default voltage for auto shut down alarm is 3.4V
3. Lower power alarm will be sent every 10 minutes.
   Auto shut down alarm will be sent 1 time.
4. Low battery Alarm(alarm type: Ox10)
5. Auto shutdown alarm(alarm type: Ox09)

Over Speeding Alarm	*$$$$$$,005,S,X,Y,Z#	*000000,005,1,50,5,20#

Remarks: S=1 Enable over speed alarm,

S=0 Disable over speed alarm.

X= [10<XXX<250] (The speed preset value) Unit: km/h

Y= [1,999] (The times over speed happens.) Unit: second

Z= [10,360] (The time interval to send speed alarm) Unit: second.

e.g. *000000,005,1,50,5,20#

The device will generate over speed alarm as soon as 5 times over speeding are detected.

After that, if over speeding status is still existing regardless how many times over speeding happens), the device will send alarm data at the interval of 20 secs.

Note: Because the device outputs the GPRMC data every second, the device will judge the vehicle speed with the speed from GPRMC data every second. So how many times the over speeding happens, means how many seconds the over speeding happens.

Set Geo-fence alarm	*$$$$$$,006,+lat1,+long1,+lat2,+long2,X,Y#	*000000,006,+1030.5400,-06647.3910,+1025.2522,-06659.2650,10,2#

Remarks:

Lat=[-9000.0000,+9000.0000]

Long=[-18000.0000,+18000.0000]

X= [10,360] For time interval send alarm message.

Y=0, Disable GEO-fence alarm.

Y=1, Into GEO-fence alarm.

Y=2, Out of GEO-fence alarm.

e.g.

Note: 1. Long1>long2&lat1>lat2

2. Make sure the position of north latitude and east longitude set it (+),otherwise set it (-)

3. Format:+AAAAA.BBBB

4. Make sure set the two positions have the same digit after comma.

Extended Functions	*$$$$$$,008,ABCDEFG#	*000000,008,1011100011#

Remarks:

A=0, Disable position report function which get position SMS by Calling

=1, Enable position report function which get position SMS by Calling

B=0, Send the SMS in Text format.

=1, Send the SMS in NMEA format.

C=1, AVL do NOT hung up when one call incoming

=0, AVL hung up after 4~5 rings when call incoming

D=0

E=0, ADB Normal AD collect

=1, ADB Oil collect .(The average of two minutes to collect)

F=0, ADA Normal AD collect. (means device collect the voltages from analog input cables)

=1, ADA Oil collect .(The average of two minutes to collect)

The difference of two method is:

Normal AD collect will output the AD value currently

AD collect percentage will output the value of fuel percent.

G=0

e.g. ***000000,008,1000000#**

It disables the wiretapping (listen-in) feature.

***000000,008,0010000#**

It enables the wiretapping (listen-in) feature. It means you can hear what's happening around the driver.

Change Baud rate	*$$$$$$,009,S#	*$$$$$$,009,1#

Remarks:

S=0, work in 900/1800

S=1, work in 850/1900

S=2, Automatic selection

Note: the default of parameter is S=2, Automatically select the frequency band,

If the unit of GSM module support three frequency (900/1800/1900), then you could set the parameter to S=0.

If the unit of GSM module support the four, frequency (850/900/1800/1900), then you could set the parameter to S=1.

Set APN	*$$$$$$,011,APN,Username,Password#	*$$$$$$,011,cmnet, , #
Remarks: APN : APN string (must < 28 chars) User name: Your username for GPRS service (must< 28 chars) Password: Your password (must < 28 chars) **e.g. *000000,011,CMNET,,##** Note: If no username or password, then left it blank.		
Set DNS Server IP	*$$$$$$,014, X,DNS1,DNS2#	*000000,8.8.8.8,8.8.4.4#
Remarks: X=0, Disable the DNS Server IP function =1, Enable the DNS Server IP function **e.g. *000000,8.8.8.8,8.8.4.4#** Note: 1. For DNS1 and DNS2 , please check with your DNS server provider for the DNS Server IP) 2. If you use the DNS setting, meanwhile you should set the command 015 like this: ***000000,015, *$$$$$$,015,X,domain,PORT#** (domain like: www.example.com)		
Set IP Address Or Domain & port	*$$$$$$,015,X,IP/DN,PORT#	*$$$$$$,015,X,IP/DN,PORT#
Remarks: X=0 use IP connect the server X=1 use DN connect the server IP : xxx.xxx.xxx.xxx; like: 8.8.8.8 DN:(domain name) ; like: www.example.com PORT : [1,65535]		
Enable GPRS Tracking	*$$$$$$,016,X#	*000000,016,1#
X=0, enable GPRS Tracking function; X=1, disable GPRS Tracking function;		
Set GPRS Interval	*$$$$$$,018,X,Y#	*000000,018,10,999#
Remarks: X =0 Stop send time interval GPRS =[10,999] Time interval (Unit: sec) Y =0, stop send time interval GPRS = [1,999] send YYY GPRS data, and then stop. = 999, continue sending GPRS data un-stop Notes: X is 3 digits at most; Y is 3 digits at most =999, continue send GPRS un-stop		
Set the GPRS mode	*$$$$$$,019,X#	*000000,019,X#
X=0, Use the UDP mode X=1, Use the TCP mode.		
Heart Beat		
Heart Beat Switch	*$$$$$$,040,X#	*000000,040,1#
X=0 Disable the heart beat function X=1 Enable the heart beat function		
Heart Beat Intervals	*$$$$$$,041,X#	*000000,041,X#
X is the heart beat interval, unit is minute [1<X<9999] X=0, Disable this function. X=1, Enable this function.		

Heart Beat Init	*$$$$$$,042,0#	*000000,042,0#
When receive this command, the heart beat will re-count time		
Sleep Mode		
Tremble sensor On/Off	*$$$$$$,021,X,Y#	*000000,021,1,1#
Remarks: X = 0, Disable Sleep mode X = 1, Enable Sleep mode Y = 0, Disable the tremble sensor Y = 1, Enable the tremble sensor		
Set the Module	*$$$$$$,022,X,Y#	*000000,022,0,1#
X=0, Close the GPS module when into sleep X=1, Open the GPS module when into sleep. Y=0, Close the GSM module when into sleep Y=1, Open the GSM module when into sleep		
Wake up from Tremble	*$$$$$$,043,X#	*000000,043,10#
After the tremble sensor continuous tremble for X second, tracker will wake up X=[1,255] (Unit : second) **eg. *000000,043,10#** Tracker Wake up from sleep mode after no tremble for 10 second:		
Into sleep mode when without tremble for preset time	*$$$$$$,044,X#	*000000,044,30#
After the tremble sensor don't tremble for X second, tracker will into sleep mode X = [30,65536] (Unit : second) **eg: *000000,044,30#** Tracker into sleep mode after no tremble for 30 second:		
Output control		
Output Control (unlimited)	*$$$$$$,025,X,Y#	*000000,025,A,1#
X=A means the output1(port 4) Y=0, Out port is low (the oil of circuit is restore) Y=1, Out port is high (the oil of circuit will cut off) In this example, if the tracker has used IO 4 to connect with car engine and relay, once tracker received this command, it will cut the engine of the vehicle promptly.		
Output Control (limited)	*$$$$$$,116,A# *$$$$$$,117,A,B,C,D#	*$$$$$$,116,A# *$$$$$$,117,A,B,C,D#
Remarks: This function is achievable only when the speed is below 10km/h(command 120) or 20km/h(command 220) and meantime GPS is available. A=[0,999]km/h , the threshold of speed. B=[0,60000] ms, the interval of outA off C=[0,60000] ms, the interval of OutA on		

D=[0,99], the times of OutA change If the speed is lower than, the OutA will off B seconds, then restore C seconds, repeat it D times. Note：because of the safety, you had better set the parameter like this: *000000,117,60,500,3000,5#		
Parking alarm	*$$$$$$,110,X#	*$$$$$$,110,1#
X=1 Enable Tremble alarm function, then if tracker is Trembling for 5s continually, it will alarm(0x30), X=0 Disable Tremble alarm function **eg: *000000,110,1#** Tracker will send an alarm (0x30) to server via GPRS if it is Trembling for 5s continually.		
Preset Oil sensor	*$$$$$$,113,A,B#	*000000,113,100,500#
Remarks: A= [0, 2000], the real voltage is [0,20V]. B= [0, 2000], the real voltage is [0,20V]. A is the empty fuel of corresponding voltage, B is the full fuel of corresponding voltage. *note: Every different types of car have different corresponding relation. Please test it by yourself, and then set the command. **eg: *000000,113,100,500#** it means empty fuel of corresponding voltage is 1V,and the he full fuel of corresponding voltage is 5V,if the AVL detect the voltage is 4V,then the value of fuel percentage is (4-1)/(5-1)=75%.		
Extend Setting	*$$$$$$,118,ABCDEFGH#	*$$$$$$,118,ABCDEFGH#
Remarks: A=0, Disable send the interval GPRS data normally when trembles (Default) A=1, Enable send the interval GPRS data normally when trembles B=0, Disable send the interval GPRS data normally when Input 1 (Port 5) close(Default) B=1, Enable send the interval GPRS data normally when Input 1 (Port 5) close C=0, Disable send the interval GPRS data normally when Input 2 (Port 3) close(Default) C=1, Enable send the interval GPRS data normally when Input 2 (Port 3) close D=E=F=G=H=0, reserved		
Acceleration and deceleration alarm	*$$$$$$,120,A,B,C#	*$$$$$$,120,A,B,C#
Remarks: A=0 Disable this function. (Default) A=1 Active this function. B= [0,2000] Acceleration 0.1m/S'2 B= [0,2000] deceleration 0.1m/S'2		
Switch of data sending by trembles or ACC	*$$$$$$,118,ABCDEFGH#	*$$$$$$,118,ABCDEFGH#
Remarks: A=0, Disable send the interval GPRS data normally when trembles (Default) A=1, Enable send the interval GPRS data normally when trembles B=0, Disable send the interval GPRS data normally when Input 1 (Port 5) close(Default) B=1, Enable send the interval GPRS data normally when Input 1 (Port 5) close C=0, Disable send the interval GPRS data normally when Input 2 (Port 3) close(Default) C=1, Enable send the interval GPRS data normally when Input 2 (Port 3) close		

Reading the IMEI number.	*$$$$$$,801#	*$$$$$$,801#
This command to require the IMEI number and the firmware of version.		
Initialization Tracker	*$$$$$$,990,099#	*$$$$$$,990,099#
It will set all parameter to factory default value (Excluding the Password).		
Reboot by SMS command	*$$$$$$,991#	*$$$$$$,991#
It will reboot the tracker by this SMS command.		

-End-